

**REMARKS**

Reconsideration and allowance of the above-identified application are respectfully requested.

Claims 1-72 are currently pending, wherein claims 1, 9, 17, 25, 33, 41, 49, 57 and 65 are independent. Claims 1, 9, 17, 25, 33, 41, 49, 57 and 65 have been amended. Support for these amendments can be found at least on page 9, paragraphs 0019 and 0020, and Figures 2 and 3 of the present application. No new matter has been introduced by way of these amendments.

The specification has been amended merely to include a claim for priority to U.S. Patent Application No. 09/629,092 (now U.S. Patent No. 6,775,529), filed July 31, 2000, and cross-references to related applications. Accordingly, submitted concurrently herewith are a Petition to Accept an Unintentionally Delayed Claim for Priority, a Supplemental Declaration, and a Supplemental Application Data Sheet in support for the claim for priority.

Applicant notes with appreciation the acceptance by the Patent Office of the drawings filed on August 1, 2001.

Applicant further notes with appreciation the acknowledgment by the Patent Office of the Information Disclosure Statements previously submitted to the Patent Office.

Applicant would like to thank Examiner Eugene Yun for the personal interview conducted on December 13, 2005. In compliance with M.P.E.P. § 713.04, the substance of that interview is incorporated in the following remarks.

During the interview, the rejection of claims 1-5, 8-13, 16-21, 24-29, 32-37, 40-45, 48-53, 56-61, 64-69 and 72 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Dankberg et al. (U.S. Patent No. 5,596,439, hereinafter "Dankberg") in view of Hardy (U.S.

Patent No. 6,556,677, hereinafter "Hardy") was discussed. No agreement was reached.

These rejections are respectfully traversed.

Merely to facilitate and expedite prosecution in the present application, independent claims 1, 9, 17, 25, 33, 41, 49, 57 and 65 have been amended. For example, independent claim 1 has been amended to recite that the second sub-circuit is configured to generate a current signal, in which the first differential signal component of the composite differential signal comprises the current signal, and voltage signals are derived in accordance with the current signal, in which the first and second single-ended replica transmission signals comprise the voltage signals.

Neither Dankberg nor Hardy, whether considered alone or in combination, nor any of the art of record teaches or suggests at least the feature of a second sub-circuit that generates a current signal, in which the first differential signal component comprises the current signal, and, in particular, converting the same current signal into voltage signals to derive the first and second single-ended replica transmission signals. For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Hardy does not render the subject matter of independent claim 1 obvious.

In addition, as understood by Applicant, Dankberg is directed to a source transmitted signal that is cancelled at the receiver associated with the transmitter, so that the desired received signal can be extracted from a composite received signal. The composite received signal consists of the source signal relayed from a relay station along with the desired received signal from the other user in the pair, plus additive noise. According to Dankberg, the invention takes advantage of the fact that each of the users knows *a priori* the exact structure of its source transmitted signal and can estimate the channel characteristics between

the relay station and itself. [see Dankberg, Abstract] As understood by Applicant, Dankberg includes an interference canceller 112. The interference canceller 112 has five elements: a variable delay element 20 for storing a representation of the source signal, a modulator/mixer element 22, a programmable gain element 24, a subtractor 26, and a parameter estimation element 28. [see Dankberg, column 4, lines 35-38; column 4, line 55-column 5, line 16]

As acknowledged by the Patent Office, Dankberg does not teach or suggest the features of a second sub-circuit that produces first and second single-ended replica transmission signals which together substantially comprise a replica of the first differential signal component of the composite differential signal, and a third sub-circuit that is coupled to the first and second sub-circuits, and which produces the differential replica transmission signal from the first and second single-ended replica transmission signals, as recited in, for example, independent claim 1 of the present application.

As understood by Applicant, Hardy is directed to a single-ended echo cancellation system and method. [see Hardy, Title] As taught by Hardy, “the system of the present invention provides **single ended** echo cancellation.” [Hardy, column 4, lines 32-33 (emphasis added)] More particularly, echoes are cancelled at the first end of a telephone call by marking every other byte of a first digital representation of a first analog signal originating at the first end of the call with a signature. A second digital representation of a second analog signal from the second end of the call is received at the first end and split into a stream of odd number bytes and a stream of even number bytes. The streams of bytes are analyzed for the presence of the signature and one of the streams of bytes is converted to a third analog signal if the signature is detected. [see Hardy, Abstract]

Consequently, as Hardy is directed to single-ended echo cancellation, it is respectfully submitted that Hardy does not teach or even suggest a second sub-circuit which produces first and second single-ended replica transmission signals **which together substantially comprise a replica of the first differential signal component of the composite differential signal,** and a third sub-circuit that is coupled to the first and second sub-circuits, and **which produces the differential replica transmission signal from the first and second single-ended replica transmission signals.** Therefore, it is respectfully submitted that Hardy does not address the above-identified deficiencies of Dankberg.

During the interview, the Patent Office clarified its position. With respect to Figure 3 of Hardy, the Patent Office noted that Hardy teaches that "if there is an echo, first analog signal 51 is coupled to a second analog signal 57 at hybrid 25 [to] form a second analog signal (plus echo), indicated at 59. Second analog signal 59 is converted to a digital representation of second analog signal (plus echo), as indicated at 61." [Hardy, column 4, lines 19-24] The Patent Office asserts that the digital representation of the second analog signal is inherently a differential signal. Contrary to the Patent Office's assertions, it is respectfully submitted that nowhere does Hardy teach or even suggest differential signals, nor, in particular, that the digital representation of the second analog signal is any type of differential signal, either explicitly or inherently. Hardy merely teaches that the second analog signal is formed from the first analog signal and the echo, and that the second analog signal is merely converted into the digital domain using an analog-to-digital converter 27. It is respectfully submitted that the Patent Office's interpretation of Hardy is wholly and completely unfounded.

For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Hardy does not render the subject matter of independent claim 1 obvious.

Additionally, according to established mandates of the patent laws, “[t]o establish a prima facie case of obviousness . . . there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” [M.P.E.P. § 2142]

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” [M.P.E.P. § 2143.01] “The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved.” [*In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000)] The showing must be “clear and particular, and it must be supported by **actual evidence**.” [*Teleflex, Inc. v. Ficosa North American Corp.*, 299 F.3d 1313, 1334, 63 U.S.P.Q.2d 1374, 1387 (Fed. Cir. 2002) (quoting *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999)) (emphasis added)] It is not sufficient to rely on “common sense and common knowledge,” as there must be specific evidence to support the motivation. [*See In re Lee*, 277 F.3d. 1338, 1344-45, 61 U.S.P.Q.2d 1430, 1434-35 (Fed. Cir. 2002)]

It is respectfully submitted that the Patent Office has made no showing of a motivation to combine based on actual, specific evidence. With respect to the combination of Dankberg with Hardy, the Patent Office asserts that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Hardy to said device of Dankberg in order to provide improved echo cancellation.” [Office Action,

page 3] It is respectfully submitted that the Patent Office's alleged motivation is simply a bald, naked assertion, completely unsupported by any actual, specific, evidence. For example, it is respectfully noted that the Patent Office has failed to provide any citation to Dankberg, Hardy or otherwise in support of the alleged motivation to combine. Consequently, it is respectfully submitted that the Patent Office has not established a *prima facie* case of obviousness.

Rather, according to M.P.E.P. § 2142, "[t]o reach a proper determination under 35 U.S.C. 103, . . . impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of the facts gleaned from the prior art." Furthermore, according to M.P.E.P. § 2143.01, "[t]he mere fact that references can be . . . modified does not render the resultant combination obvious unless the prior art also suggests the desirability of [such modification]." [*citing* In re Mills, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990)] Since the Patent Office has offered no proper support or motivation for combining the references, it is respectfully submitted that the rejection based on obviousness is clearly and unequivocally founded upon "knowledge gleaned only from applicant's disclosure." [*see* M.P.E.P. § 2145] Consequently, it is respectfully submitted that the rejection entails hindsight and is, therefore, improper.

Independent claims 9, 17, 25, 33, 41, 49, 57 and 65 recite features similar to those recited in independent claim 1, and are, therefore, patentably distinguishable over the combination of Dankberg and Hardy for at least those reasons state above with regard to claim 1.

Dependent claims 2-5, 8, 10-13, 16, 18-21, 24, 26-29, 32, 34-37, 40, 42-45, 48, 50-53, 56, 58-61, 64, 66-69 and 72 variously depend from independent claims 1, 9, 17, 25, 33, 41,

49, 57 and 65, and are, therefore, patentably distinguishable over the combination of Dankberg and Hardy for at least those reasons stated above with regard to claims 1, 9, 17, 25, 33, 41, 49, 57 and 65.

For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Hardy does not render the subject matter of claims 1-5, 8-13, 16-21, 24-29, 32-37, 40-45, 48-53, 56-61, 64-69 and 72 obvious. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

In the third section of the Office Action, claims 6, 7, 14, 15, 22, 23, 30, 31, 38, 39, 46, 47, 54, 55, 62, 63, 70 and 71 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Dankberg and Hardy, and further in view of Chatterjee et al. (U.S. Patent No. 5,898,340, hereinafter "Chatterjee"). These rejections are respectfully traversed.

Dependent claims 6, 7, 14, 15, 22, 23, 30, 31, 38, 39, 46, 47, 54, 55, 62, 63, 70 and 71 variously depend from independent claims 1, 9, 17, 25, 33, 41, 49, 57 and 65, and are, therefore, patentably distinguishable over the combination of Dankberg, Hardy and Chatterjee for at least those reasons stated above with regard to claims 1, 9, 17, 25, 33, 41, 49, 57 and 65.

For example, it is respectfully submitted that Chatterjee does not teach or suggest at least the feature of a second sub-circuit that generates a current signal, in which the first differential signal component comprises the current signal, and, in particular, converting the same current signal into voltage signals to derive the first and second single-ended replica transmission signals, as recited in, for example, independent claim 1 of the present application. In addition, it is respectfully submitted that Chatterjee does not teach or suggest the features of a second sub-circuit that produces first and second single-ended replica

transmission signals which together substantially comprise a replica of the first differential signal component of the composite differential signal, and a third sub-circuit that is coupled to the first and second sub-circuits, and which produces the differential replica transmission signal from the first and second single-ended replica transmission signals, as further recited in, for example, independent claim 1 of the present application. Accordingly, it is respectfully submitted that Chatterjee does not address the above-identified deficiencies of Dankberg and Hardy.

Additionally, it is respectfully submitted that the Patent Office has made no showing of a motivation to combine based on actual, specific evidence. With respect to the combination of Dankberg, Hardy and Chatterjee, the Patent Office asserts that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Chatterjee to the modified device of Dankberg and Hardy in order to provide improved power efficiency." [Office Action, page 4 – page 5] Again, it is respectfully submitted that the Patent Office's alleged motivation is simply a bald, naked assertion, completely unsupported by any actual, specific, evidence. For example, it is respectfully noted that the Patent Office has failed to provide any citation to Dankberg, Hardy, Chatterjee or otherwise in support of the alleged motivation to combine. Consequently, it is respectfully submitted that the Patent Office has not established a *prima facie* case of obviousness. Rather, since the Patent Office has offered no proper support or motivation for combining the references, it is respectfully submitted that the rejection based on obviousness is clearly and unequivocally founded upon "knowledge gleaned only from applicant's disclosure." [*see* M.P.E.P. § 2145] Consequently, it is respectfully submitted that the rejection entails hindsight and is, therefore, improper.



For at least the foregoing reasons, it is respectfully submitted that the combination of Dankberg and Hardy does not render the subject matter of claims 6, 7, 14, 15, 22, 23, 30, 31, 38, 39, 46, 47, 54, 55, 62, 63, 70 and 71 obvious. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

All of the rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited. Should the Examiner have any questions regarding this response or the application in general, the Examiner is urged to contact the Applicant's attorney, Michael D. Wiggins, by telephone at (248) 641-1211. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

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